What is claimed is:

1. An acoustic logging apparatus, comprising:
   - a drill collar conveyed on a drilling tubular in a borehole within a formation;
   - at least one electromagnetically energized actuator on said drill collar;
   - at least one transmitting element disposed on said drill collar; and
   - a flexure ring coupled to the at least one electromagnetically energized actuator and to the at least one transmitting element for converting an electromagnetically energized actuator displacement into a related transmitting element displacement.
2. The acoustic logging apparatus of claim 1, wherein displacement of said at least one transmitting element generates an acoustic signal transmitted into the formation.
3. The acoustic logging apparatus of claim 1, wherein the at least one electromagnetically energized actuator comprises a magnetostrictive actuator.
4. The acoustic logging apparatus of claim 1, wherein the at least one electromagnetically energized actuator comprises an electrostrictive actuator.
5. The acoustic logging apparatus of claim 1, wherein the transmitting element comprises a piston.
6. The acoustic logging apparatus of claim 3, wherein the at least one magnetostrictive actuator comprises:
   - a magnetostrictive material; and

- at least one coil surrounding said magnetostrictive material imparting a predetermined magnetic field in said magnetostrictive material when said coil is energized causing said magnetostrictive material to dimensionally change by a predetermined amount causing said magnetostrictive actuator displacement.

7. The acoustic logging apparatus of claim 1, wherein the electromagnetically energized actuator displacement is substantially parallel to a collar axis and the transmitting element displacement is substantially normal to said collar axis.

8. The acoustic logging apparatus of claim 1, wherein the flexure ring comprises a metallic material.

9. The acoustic logging apparatus of claim 1, wherein the flexure ring is comprised of a shape to amplify the piston displacement relative to the magnetostrictive actuator displacement.

10. The acoustic logging apparatus of claim 9, wherein said shape is substantially oblate.

11. The acoustic logging apparatus of claim 6, wherein said magnetostrictive material comprises a rare-earth magnetostrictive material.

12. The acoustic logging apparatus of claim 11, wherein said rare earth magnetostrictive material comprises terbium, dysprosium, and iron.

13. The acoustic logging apparatus of claim 6, wherein said magnetostrictive material comprises at least one of (i) a nickel material and (ii) a nickel alloy.

14. The acoustic logging apparatus of claim 1, wherein said at least one electromagnetically energized actuator is disposed in at least one pocket formed in an outer surface of said drill collar.

15. The acoustic logging apparatus of claim 1, further comprising a sensor coupled to said flexure ring for detecting the displacement of said flexure ring and generating a signal related thereto.

16. The acoustic logging apparatus of claim 15, wherein said sensor signal is used by a controller to control said electromagnetically energized actuator displacement.

17. The acoustic logging apparatus of claim 6, wherein said at least one coil comprises a plurality of coils, each coil of said plurality of coils adapted to operate over a different predetermined frequency range.

18. The acoustic logging apparatus of claim 1, wherein said flexure ring is adapted to resonate at least one predetermined operational frequency to enhance the displacement of the transmitting element.

19. A method of generating an acoustic logging signal comprising:

- conveying a drill collar on a drilling tubular into a borehole within a formation;
- disposing at least one electromagnetically energized actuator on said drill collar;
- disposing at least one transmitting element on said drilling collar;
- coupling said at least one transmitting element to said at least one electromagnetically energized actuator by a flexure ring converting an electromagnetically energized actuator displacement into a related transmitting element displacement ; and
- energizing said at least one electromagnetically energized actuator causing a related transmitting element displacement for transmitting an acoustic signal in said formation.

20. The method of claim 19, wherein the at least one electromagnetically energized actuator comprises a magnetostrictive actuator.

21. The method of claim 19, wherein the at least one electromagnetically energized actuator comprises an electrostrictive actuator.

22. The method of claim 19, wherein the transmitting element comprises a piston.

23. The method of claim 19, wherein the at least one electromagnetically energized actuator comprises:

- a magnetostrictive material; and
- at least one coil surrounding said magnetostrictive material imparting a predetermined magnetic field in said magnetostrictive material when said coil is energized causing said magnetostrictive material to lengthen by a predetermined amount causing said magnetostrictive actuator displacement.

24. The method of claim 19, wherein the electromagnetically energized actuator displacement is substantially parallel to a drill collar axis and the transmitting element displacement is substantially normal to said drill collar axis.

25. The method of claim 19, wherein the flexure ring comprises a metallic material.

26. The method of claim 19, wherein the flexure ring is comprised of a shape to amplify the piston displacement relative to the electromagnetically energized actuator displacement.

27. The method of claim 26, wherein said shape is substantially oblate.

28. The method of claim 23, wherein said magnetostrictive material comprises a rare-earth magnetostrictive material.

29. The method of claim 28, wherein said rare earth magnetostrictive material includes terbium, dysprosium, and iron.

30. The method of claim 23, wherein said magnetostrictive material comprises at least one of (i) a nickel material and (ii) a nickel alloy.

31. The method of claim 19, wherein said at least one electromagnetically energized actuator is disposed in a pocket formed in an outer surface of said drill collar.

32. The method of claim 19, further comprising a sensor coupled to said flexure ring for detecting the displacement of said flexure ring and generating a signal related thereto.

33. The method of claim 32, wherein said sensor signal is used by a controller to control said magnetostrictive actuator displacement.

34. The method of claim 23, wherein said at least one coil comprises a plurality of coils, each coil of said plurality of coils adapted to operate over a different predetermined frequency range.

35. The method of claim 19, wherein said flexure ring is adapted to resonate at least one predetermined operational frequency to enhance the displacement of the piston.

36. A transmitter for use in an acoustic logging tool, comprising:

- at least one magnetostrictive actuator providing a displacement substantially parallel to a longitudinal axis of said acoustic logging tool;
- a piston adapted to move substantially normal to said longitudinal axis of said acoustic logging tool; and
- a flexure ring cooperatively coupled to said magnetostrictive actuator and to said piston for converting said magnetostrictive actuator displacement into a related piston displacement.

37. The transmitter of claim 36, wherein the at least one magnetostrictive actuator includes:

- a magnetostrictive material; and
- at least one coil surrounding said magnetostrictive material imparting a predetermined magnetic field in said magnetostrictive material when said coil is energized causing said magnetostrictive material to lengthen by a predetermined amount causing said magnetostrictive actuator displacement.

38. The transmitter of claim 36, wherein the flexure ring comprises a metallic material.

39. The transmitter of claim 36, wherein the flexure ring is comprised of a shape to amplify the piston displacement relative to the magnetostrictive actuator displacement.

40. The transmitter of claim 39, wherein said shape is substantially oblate.

41. The transmitter of claim 37, wherein said magnetostrictive material comprises a rare-earth magnetostrictive material.

42. The transmitter of claim 41, wherein said rare earth magnetostrictive material comprises terbium, dysprosium, and iron.

43. The transmitter of claim 37, wherein said magnetostrictive material comprises at least one of (i) a nickel material and (ii) a nickel alloy.

44. The transmitter of claim 36, wherein said at least one transmitter is disposed in a pocket formed in an outer surface of a drill collar that is part of said acoustic logging tool.

45. The transmitter of claim 36, wherein said at least one transmitter comprises a plurality of transmitters disposed circumferentially around said drill collar.

46. The transmitter of claim 36, further comprising a sensor coupled to said flexure ring for detecting the displacement of said flexure ring and generating a signal related thereto.

47. The transmitter of claim 46, wherein said sensor signal is used by a controller to control said magnetostrictive actuator displacement.

48. The transmitter of claim 37, wherein said at least one coil comprises a plurality of coils, each coil of said plurality of coils adapted to operate over a different predetermined frequency range.

49. The transmitter of claim 36, wherein said flexure ring is adapted to resonate at least one predetermined operational frequency to enhance the displacement of the piston.